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**JENNIFER K. JACOBS, Ph.D.**  
Associate Research Professor  
Institute of Cognitive Science  
University of Colorado Boulder

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**EDUCATION**

- 1999 **Ph.D., Developmental Psychology**  
University of California at Los Angeles  
*Dissertation: Assessing Teachers' Beliefs: Japanese and American Teachers' Evaluations of Videotaped Mathematics Lessons.* Chair: James Stigler, Ph.D.
- 1994 **M.A., Developmental Psychology**  
University of California at Los Angeles  
*Master's Thesis: Teachers' Evaluations of the Mathematics Instruction in American and Japanese Fifth-Grade Classrooms.* Chair: James Stigler, Ph.D.
- 1992 **B.A., Psychology and Japanese**  
University of Michigan  
With High Distinction and High Honors in Psychology  
*Honors Thesis: A Comparison of American and Japanese High School Students by Achievement Level in Mathematics.* Advisor: Harold Stevenson, Ph.D.

**PROFESSIONAL EXPERIENCE**

- 2018-present **Associate Research Professor, Institute of Cognitive Science, University of Colorado at Boulder**  
- *The TalkBack Application: Automating Analysis and Feedback to Improve Mathematics' Teachers Classroom Discourse, 2018-present*  
- *Building Capacity to Analyze and Adapt Tasks Focused on 3-Dimensional Learning, 2017-present*  
- *SchoolWide Labs: A real-time sensing and data logging platform for integrating computational thinking into middle school STEM curricula, 2017-present*  
- *An Efficacy Study of the Learning and Teaching Geometry PD Materials: Examining Impact and Context-Based Adaptations, 2015-present*  
- *Inquiry Hub, 2015-present*
- 2003-2018 **Research Faculty Associate, Institute of Cognitive Science, University of Colorado at Boulder**  
- *Talk-Back: Cyberlearning Support for Learning Equitable Mathematical Practices, 2016-2018*  
- *Refining a Model with Tools to Develop Math Professional Development Leaders: An Implementation Study, 2015-2016*  
- *Center for the Study of Interactive Knowledge Utilization, 2014-2016*  
- *Collaborative Strategic Research-Colorado: Investing in Innovation Validation Grant, 2014-2015*

- *Toward a Scalable Model of Mathematics Professional Development: A Field Study of Preparing Facilitators to Implement the Problem-Solving Cycle, 2007-2014*
- *Learning and Teaching Geometry: Videocases for Mathematics Professional Development, 2007-2014*
- *Understanding and Cultivating the Transition from Arithmetic to Algebraic Reasoning, 2003-2007*
- 1998-2003    **Associate Research Scientist, LessonLab, Santa Monica, CA**  
*Third International Mathematics and Science (TIMSS) 1999 Video Study*
- 1993-1998    **Graduate Student Researcher, Departments of Psychology and Psychiatry, University of California at Los Angeles**  
- *Third International Mathematics and Science (TIMSS) 1995 Video Study, 1993-1998*  
- *Family Lifestyles Study, 1993-1997*  
- *Japanese and American Elementary School Classrooms, 1995*
- 1989-1992    **Research Assistant, Institute of Social Research, University of Michigan**  
*Social Relations and Mental Health over the Life Course*

## GRANTS AND FUNDING

- Sumner, T. (PI CU Boulder), with Jacobs, J. (co-PI), Wayne Ward (CU Boulder), William Foland (CU Boulder) and Chenhao Tan (CU Boulder). *The TalkBack Application: Automating Analysis and Feedback to Improve Mathematics Teachers' Classroom Discourse*. A BigData grant sponsored by the National Science Foundation. Total award: \$1,998,505.
- Sumner, T. (PI CU Boulder), with Jacobs, J. (co-PI), Bill Penuel (CU Boulder) and Susan Olezene (Denver Public Schools). *SchoolWide Labs: A real-time sensing and data logging platform for integrating computational thinking into middle school STEM curricula*. A STEM+C Collaborative Research grant sponsored by the National Science Foundation. Total award \$2,123,801.
- Jacobs, J. (PI), with Nanette Seago (WestEd) and Karen Koellner (Hunter College). *An Efficacy Study of the Learning and Teaching Geometry PD Materials: Examining Impact and Context-Based Adaptations*. A DR-K12 grant sponsored by the National Science Foundation. Total award \$2,808,325.
- Jacobs, J. (PI), with Karen Koellner (Hunter College), Edward Wiley (CU Boulder); and Hilda Borko (Stanford University). *Toward a Scalable Model of Mathematics Professional Development: A Field Study of Preparing Facilitators to Implement the Problem-Solving Cycle*. A DR-K12 grant sponsored by the National Science Foundation. Total award \$1,641,009.
- Seago, N. (PI, WestEd) with Mark Driscoll (Education Development Center), Patrick Callahan (University of California), Jennifer Jacobs (CU Boulder) and Hilda Borko (Stanford University). *Learning and Teaching Geometry: VideoCases for Mathematics Professional Development*. A DR-K12 grant sponsored by the National Science Foundation. Total award \$2,973,792.

## PUBLICATIONS

- Seago, N., Jacobs, J. & Koellner, K. (in preparation). Using a classroom observation instrument to measure instructional shifts in mathematics teaching practice.
- Koellner, K., Seago, N. & Jacobs, J. (under review). Instructional change after participating in a highly specified, videocase-based mathematics professional development: A mixed-methods exploration of impact.
- Jacobs, J.K., Koellner, K., Seago, N., Garnier, H. & Wang, C. (2020). Professional development to support the learning and teaching of geometry: Examining the impact on teacher knowledge, instructional practice and student learning in two contexts. In P. Jenlink (Ed.), *The Language of mathematics: How the teacher's knowledge of mathematics affects instruction* (pp.143-173). Lanham, MD: Rowman and Littlefield.
- Raza, A., Penuel, W., Jacobs, J. & Sumner, T. (in press). Supporting equity in using visual learning analytics to document students' classroom experiences. In M. Schmidt, A. Tawfik, Y. Earnshaw & I. Jahnke, (Eds.), *Learner and user experience research: An introduction for the field of learning design and technology*: Edtechbooks.
- Biddy, Q., Gendreau Chakarov, A., Jacobs, J., Penuel, W., Recker, M. & Sumner, T. (in press). Professional development supporting middle school teachers to integrate computational thinking into their science classes. In C. Mouza, A. Yadav & A. Leftwich (Eds.), *Preparing teachers to teach computer science: Models, practices and policies*. Information Age Publishing.
- Gendreau Chakarov, A., Recker, M., Jacobs, J., Sumner, T. (2019). Designing a middle school science curriculum that integrates computational thinking and sensor technology. In Proceedings of the 50<sup>th</sup> ACM Technical Symposium on Computer Science Education (pp. 818-824). Association for Computing Machinery.
- Penuel, W., Turner, M., Jacobs, J., Van Horne, K. & Sumner, T. (2019). Developing tasks to assess phenomenon-based science learning: Challenges and lessons learned from building proximal transfer tasks. *Science Education*, 103(6), 1367-1395.
- Suresh, A., Sumner, T., Jacobs, J., Foland, B. & Ward, W. (2019). Automating analysis and feedback to improve mathematics teachers' classroom discourse. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 33, pp. 9721-9728).
- Jacobs, J., Boardman, A., Potvin, A., & Wang, C. (2018). Understanding teacher resistance to instructional coaching. *Professional Development in Education*, 44(5), 690-703. DOI: 10.1080/19415257.2017.1388270
- Koellner, K., Seago, N. & Jacobs, J. (2018). Representations of practice to support teacher instruction: Video case mathematics professional development. In O. Buchbinder & S. Kuntze (Eds.), *Mathematics Teachers Engaging with Representations of Practice* (pp. 9-22). ICME-13 Monographs. Springer International Publishing, Switzerland.
- Seago, N., Koellner, K. & Jacobs, J. (2018). Video in the middle: Purposeful design of video-based mathematics professional development. *Contemporary Issues in Technology and Teacher Education*, 18(1), 29-49.
- Suresh, A., Sumner, T., Huang, I., Jacobs, J., Foland, B., & Ward, W. (2018, December). Using deep learning to automatically detect talk moves in teachers' mathematics lessons. In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 5445-5447). IEEE
- Jacobs, J., Seago, N. & Koellner, K. (2017). Preparing facilitators to use and adapt professional development materials productively. *International Journal of STEM Education*, 4(1), 30.

- Seago, N., Jacobs, J., Driscoll, M., Callahan, P., Matassa, M. & Nikula, J. (2017). *Learning and teaching geometry: Video cases for mathematics professional development, grades 5-10*. San Francisco, CA: WestEd.
- Borko, H., Jacobs, J., Koellner, K. & Swackhamer, L. (2015). *Mathematics professional development: Improving teaching using the Problem-Solving Cycle and Leadership Preparation models*. Columbia University, NY: Teachers College Press.
- Koellner, K. & Jacobs, J. (2015). Distinguishing models of professional development: The case of an adaptive model's impact on teachers' knowledge, instruction, and student achievement. *Journal of Teacher Education*, 66(1), 51-67. DOI: 10.1177/0022487114549599.
- Borko, H., Jacobs, J., Seago, N. & Mangram, C. (2014). Facilitating video-based professional development: Planning and orchestrating productive discussions. In Y. Li, E.A. Silver & S. Li (Eds.), *Transforming mathematics instruction: Multiple approaches and practices* (pp. 259-281). Dordrecht, Netherlands: Springer International Publishing Switzerland.
- Borko, H., Koellner, K. & Jacobs, J. (2014). Examining novice teacher leaders' facilitation of mathematics professional development. *Journal of Mathematical Behavior*, 33, 149-167.
- Jacobs, J., Koellner, K., John, T. & King, C. (2014). The process of instructional change: Insights from the Problem-Solving Cycle. In Y. Li, E.A. Silver & S. Li (Eds.), *Transforming mathematics instruction: Multiple approaches and practices* (pp. 335-354). Springer International Publishing Switzerland.
- Seago, N.M., Jacobs, J.K., Heck, D.J., Nelson, C.L. & Malzahn, K.A. (2014). Impacting teachers' understanding of geometric similarity: Results from field testing of the Learning and Teaching Geometry professional development materials. *Professional Development in Education*, 40(4), 627-653. DOI:10.1080/19415257.2013.830144
- Seago, N., Jacobs, J., Driscoll, M., Nikula, J., Matassa, M. & Callahan, P. (2013). Developing teachers' knowledge of a transformations-based approach to geometric similarity. *Mathematics Teacher Educator*, 2(1), 74-85.
- Jacobs, J., Koellner, K. & Funderburk, J. (2012). Problem solved: Middle school math instruction gets a boost from a flexible model for learning. *Journal of Staff Development*, 33(2), 32-39.
- Seago, N., Nikula, J., Matassa, M. & Jacobs, J. (2012). A transformations-based approach to learning and teaching similarity. In *Proceedings for the 12th International Congress on Mathematics Education, Topic Group 10*, (pp. 2298-2304). Seoul, Korea.
- Borko, H., Koellner, K., & Jacobs, J. (2011). Meeting the challenges of scale: The importance of preparing professional development leaders. *Teachers College Record*, Date Published: March 04, 2011. <http://www.tcrecord.org> ID Number: 16358, Date Accessed: 3/13/2011
- Borko, H., Koellner, K., Jacobs, J. & Seago, N. (2011). Using video representations of teaching in practice-based professional development programs. *Zentralblatt für Didaktik der Mathematik: International Reviews on Mathematical Education*, 43(1), 175-187. DOI 10.1007/s11858-010-0302-5
- Koellner, K., Jacobs, J. & Borko, H. (2011). Mathematics professional development: Critical features for developing leadership skills and building teachers' capacity. *Mathematics Teacher Education and Development*, 13(1), 115-136.
- Koellner, K., Jacobs, J., Borko, H., Roberts, S. & Schneider, C. (2011). Professional development to support students' algebraic reasoning: An example from the Problem-Solving Cycle Model. In J. Cai & E. Knuth, (Eds.), *Early Algebraization: A Global Dialogue from Multiple Perspectives* (pp. 429-452). New York: Springer.

- Borko, H., Jacobs, J., & Koellner, K. (2010). Contemporary approaches to teacher professional development. P. Peterson, E. Baker & B. McGaw (Eds.), *International Encyclopedia of Education, Vol 7* (pp. 548-556). Oxford: Elsevier.
- Seago, N., Driscoll, M., & Jacobs, J. (2010). Transforming middle school geometry: Professional development materials that support the teaching and learning of similarity. *Middle Grades Research Journal, 5*(4), 199-211.
- Givvin, K.B., Jacobs, J., Hollingsworth, H., & Hiebert, J. (2009). What is effective mathematics teaching? International educators' judgments of mathematics lessons from the TIMSS 1999 Video Study. In J. Cai, G. Kaiser, B. Perry, & N. Wong (Eds.), *Effective Mathematics Teaching from Teachers' Perspectives: National and Cross-National Studies* (pp.37-69). Rotterdam: Sense Publishers.
- Jacobs, J., Borko, H., & Koellner, K. (2009). The power of video as a tool for professional development and research: Examples from the Problem-Solving Cycle. T. Janik & T. Seidel (Eds.), *The Power of Video Studies in Investigating Teaching and Learning in the Classroom* (pp.259-273). Munster: Waxmann Publishing.
- Borko, H., Jacobs, J., Eiteljorg, E., & Pittman, M.E. (2008). Video as a tool for fostering productive discourse in mathematics professional development. *Teaching and Teacher Education, 24*, 417-436.
- Koellner, K. & Jacobs, J. (2008). Fostering instructional change through mathematics professional development: Focusing on teachers' self-selected goals. In *Proceedings for the Thirtieth Convergence of the International Group for the Psychology of Mathematics Education*. Merida, Mexico.
- Koellner, K., Schneider, C., Roberts, S., Jacobs, J., & Borko, H. (2008). Using the Problem-Solving Cycle model of professional development to support novice mathematics instructional leaders. In F. Arbaugh & P. M. Taylor (Eds.), *Inquiry into Mathematics Teacher Education* (pp. 59-70). San Diego, CA: Association of Mathematics Teacher Educators.
- Jacobs, J., Borko, H., Koellner, K., Schneider, C., Eiteljorg, E., & Roberts, S.A. (2007). The Problem-Solving Cycle: A model of mathematics professional development. *Journal of Mathematics Education Leadership, 10*(1), 42-57.
- Jacobs, J., Hollingsworth, H. & Givvin, K.B. (2007). Video-based research made 'easy': Methodological lessons learned from the TIMSS video studies. *Field Methods, 19*(3), 284-299.
- Koellner, K., Jacobs, J., Borko, H., Schneider, C., Pittman, M., Eiteljorg, E., Bunning, K., & Frykholm, J. (2007). The Problem-Solving Cycle: A model to support the development of teachers' professional knowledge. *Mathematical Thinking and Learning, 9*(3), 271-303.
- Givvin, K.B., Jacobs, J., & Hollingsworth, H. (2006). What does teaching look like around the world? *On-Math: Online Journal of School Mathematics, 4*(1). [http://my.nctm.org/eresources/view\\_article.asp?article\\_id=7396&page=1](http://my.nctm.org/eresources/view_article.asp?article_id=7396&page=1)
- Jacobs, J., Hiebert, J., Givvin, K.B., Hollingsworth, H., Garnier, H., & Wearne, D. (2006). Does eighth-grade teaching in the United States align with the NCTM Standards? Results from the TIMSS 1995 and 1999 Video Studies. *Journal for Research in Mathematics Education, 37*(1), 5-32.
- Borko, H., Frykholm, J., Pittman, M., Eiteljorg, E., Nelson, M., Jacobs, J., Clark, K. K., & Schneider, C. (2005). Preparing teachers to foster algebraic thinking. *Zentralblatt für*

- Didaktik der Mathematik: International Reviews on Mathematical Education*, 37(1), 43-52.
- Clark, K.K. & Jacobs, J. (2005). Using video to support teacher learning: Theory & Practice response. *AMTE Connections*, 14(3), 9-11.
- Clark, K. K., Jacobs, J. Pittman, M., & Borko, H. (2005). Strategies for building mathematical communication in the middle school classroom: Modeled in professional development, implemented in the classroom. *Current Issues in Middle Level Education*, 11(2), 1-12.
- Givvin, K.B., Hiebert, J. Jacobs, J., Hollingsworth, H., & Gallimore, R. (2005). Are there national patterns of teaching? Evidence from the TIMSS 1999 Video Study. *Comparative Education Review*, 49(3), 311-343.
- Hiebert, J., Stigler, J., Jacobs, J.K., Givvin, K.B., Garnier, H., Smith, M., Hollingsworth, H., Manaster, A., Wearne, D., & Gallimore, R. (2005). Mathematics teaching in the United States today (and tomorrow): Results from the TIMSS 1999 Video Study. *Educational Evaluation and Policy Analysis*, 27(2), 111-132.
- Hiebert, J., Gallimore, R., Garnier, H., Givvin, K.B., Hollingsworth, H., Jacobs, J., Chui, A. M., Wearne, D., Smith, M., Kersting, N., Manaster, A., Tseng, E., Etterbeek, W., Manaster, C., Gonzales, P., & Stigler, J. (2003). Understanding and improving mathematics teaching: Highlights from the TIMSS 1999 Video Study. *Phi Delta Kappan*, 84(10), 768-775.
- Hiebert, J., Gallimore, R., Garnier, H., Givvin, K.B., Hollingsworth, H., Jacobs, J., Chui, A. M., Wearne, D., Smith, M., Kersting, N., Manaster, A., Tseng, E., Etterbeek, W., Manaster, C., Gonzales, P., & Stigler, J. (2003). *Teaching mathematics in seven countries: Results from the TIMSS 1999 Video Study*. NCES (2003-013). U.S. Department of Education. Washington DC: National Center for Education Statistics.
- Jacobs, J., Garnier, H., Gallimore, R., Hollingsworth, H., Givvin, K. B., Rust, K., Kawanaka, T., Smith, M., Wearne, D., Manaster, A., Etterbeek, W., Hiebert, J., & Stigler, J. W. (2003). *TIMSS 1999 Video Study Technical Report: Volume 1: Mathematics study* (NCES 2003-012). U.S. Department of Education. Washington, DC: National Center for Education Statistics.
- Jacobs, J.K. & Morita, E. (2002). Japanese and American teachers' evaluations of videotaped mathematics lessons. *Journal for Research in Mathematics Education*, 33(3), 154-175.
- Jacobs, J.K., Kawanaka, T., & Stigler, J. (1999). Integrating qualitative and quantitative approaches to the analysis of video data on classroom teaching. *International Journal of Educational Research*, 31(8), 717-724.
- Garnier, H., Stein, J.A., & Jacobs, J.K. (1997). The process of dropping or stopping out of high school: A 19-year perspective. *American Educational Research Journal*, 34(2), 395-419.
- Jacobs, J.K., Yoshida, M., Fernandez, C., & Stigler, J. (1997). Japanese and American teachers' evaluations of mathematics lessons: A new technique for exploring beliefs. *Journal of Mathematical Behavior*, 16, 7-24.
- Jacobs, J.K., Yoshida, M., Fernandez, C. & Stigler, J.W. (1996). Japanese and American teachers' implicit theories of mathematics learning and instruction. In G.W. Cottrell (Ed.), *Proceedings of the Eighteenth Annual Conference of the Cognitive Science Society*. New Jersey: Erlbaum.

## CONFERENCE PRESENTATIONS

- Raza, A., Penuel, W., Jacobs, J. & Sumner, T. (under review). Scaffolding teachers sense making for classroom equity using visual analytics. Paper submitted to the 10<sup>th</sup> International Learning Analytics and Knowledge Conference, Frankfurt, Germany.
- Biddy, Q., Gendreau, A., Jacobs, J., Recker, M., Sumner, T., & Penuel, W. (2020). Integrating computational thinking into middle school science through co-designed storylines. Paper presented at the 2020 Association for Science Teacher Education Conference, San Antonio, TX.
- Gendreau Chakarov, A., Biddy, Q., Recker, M., Jacobs, J., Sumner, T., Hervey, S., Van Horne, K. & Penuel, W. (2019). Designing and implementing sensor-based science units that incorporate computational thinking. Paper presented to the annual meeting of the American Educational Research Association, Toronto Canada.
- Jacobs, J., Koellner, K., Seago, N., Garnier, H., & Wang, C. (2019). Context-driven learning from professional development: Examining teacher knowledge, instructional practice, and student mathematics achievement gains. Paper presented to the annual meeting of the American Educational Research Association, Toronto, Canada.
- Kali, Y., Van Horne, K., Watkins, D., Jacobs, J., Penuel, W. & Sumner, T. (2019). Ethical dilemmas and deliberative discourse as means for increasing students' science capital: A World Café-inspired design. Poster presented to the annual meeting of the American Educational Research Association, Toronto, Canada.
- Penuel, W. R., Lo, A. S., Jacobs, J. K., Gardner, A., Stuhlsatz, M. A. M., & Wilson, C. (2019). Tools for supporting teachers to build quality 3D assessment tasks. Paper presented at the NARST Annual Meeting, Baltimore, MD.
- Seago, N., Koellner, K. & Jacobs, J. (2019). The impact of a content focused video-based professional development on teacher knowledge, instructional practice, and student achievement. Paper presented to the Annual Conference of the International Group for the Psychology of Mathematics Education. Pretoria, South Africa.
- Sumner, T., Penuel, W., Gendreau Chakarov, A., Jacobs, J., Biddy, Q. & Recker, M. (2019). Evidence sharing: Designing middle school science storylines integrating sensor technologies and data driven science in the context of a research-practice partnership. Research presented at the NSF STEM+C PI meeting. Alexandria, VA.
- Suresh, A., Sumner, T., Jacobs, J., Foland, B. & Ward, W. (2019). Automating analysis and feedback to improve mathematics teachers' classroom discourse. Paper presented to the Ninth Symposium on Educational Advances in Artificial Intelligence (EAAI). Honolulu, HI.
- Van Horne, K., Jacobs, J., Penuel, W., Wilson, C. & Stuhlsatz, M. (2019). Tools for supporting teachers to build quality 3D assessment tasks. Paper presented to the NARST Annual International Conference, Baltimore, MD.
- Suresh, A., Sumner, T., Huang, I., Jacobs, J., Foland, B. & Ward, W. (2018). Using deep learning to detect talk moves in teachers' mathematics lessons. Poster presented to the IEEE International Conference on BigData, Seattle WA.
- Boardman, A., Potvin, A. & Jacobs, J. (2018). One size does not fit all: Understanding teacher preferences for instructional coaching. Poster presented at the annual meeting of the American Educational Research Association, New York, NY.
- Penuel, W., Frumin, K., Van Horne, K. & Jacobs, J. (2018). A phenomenon-based assessment system for three-dimensional science standards: What can it look like in practice? In *Implementing Common Core Math and Next Generation Science Standards: Variation*,

- supports, and barriers*. Symposium at the annual meeting of the American Educational Research Association, New York, NY.
- Penuel, W. R., Van Horne, K., Jacobs, J., & Turner, M. (2018, April). Developing a validity argument for practical measures of student experience in project-based science classrooms. Paper presented at the Annual Meeting of the American Educational Research Association, New York, NY.
- Koellner, K., Seago, N., & Jacobs, J. (2018). What do teachers take up and enact in their classroom practice from their professional development? Poster presented at the European Association for Research on Learning and Instruction, Kristiansand, Norway.
- Kollner, K., Seago, N. & Jacobs, J. (2017). Influences of specified video-based professional development on teacher practice. Paper presented to the 41<sup>st</sup> Annual Conference of the International Group for the Psychology of Mathematics Education, Singapore.
- Koellner, K. & Jacobs, J. (2017). Distinguishing models of professional development: Design, facilitation, and impact. Keynote presentation to the Association of Teacher Educators Annual Meeting, Orlando, FL.
- Penuel, W. R., Van Horne, K., Jacobs, J., Sumner, T., Watkins, D., & Quigley, D. (2017). Developing NGSS-aligned curriculum that connects to students' interests and experiences: Lessons learned from a co-design partnership. Paper presented at the NARST Annual Conference, San Antonio, TX.
- Seago, N., Koeller, K. & Jacobs, J. (2016). Preparing to facilitate mathematics professional development: Aiming for alignment between the program and the facilitator. Paper presented at the 13<sup>th</sup> International Congress on Mathematical Education, Hamburg, Germany.
- Seago, N., Jacobs, J. & Koellner, K. (2016). Supporting facilitators to use professional development materials productively. Paper presented as part of the symposium Expanding Teacher Leadership in Professional Development: Advances in the Study of Facilitation at the European Association for Research on Learning and Instruction, Zurich, Switzerland.
- Seago, N., Koellner, K. & Jacobs, J. (2015). Preparing facilitators to use and adapt video-based professional development materials. In *A Behind-the-Scenes Look at Effective Video-Based Professional Development*. Symposium at the annual meeting of the American Educational Research Association, Washington DC.
- Borko, H., Koellner, K., Jacobs, J., Khachatryan, E., Mangram, C, & Virmani, R. (2014). Practices for facilitating video-based discussions in mathematics professional development. In *Facilitating Teachers' Learning: Practices that Support Math Teachers in Developing Ambitious Practice*. Symposium at the annual meeting of the American Educational Research Association, Philadelphia, PA.
- Koellner, K., Borko, H., Jacobs, J., Mangram, C., Khachstryan, E. & Virmani, R. (2014). Practices for facilitating video-based discussions in mathematics professional development. In *Facilitating Teacher Learning to Develop Ambitious Practice in Mathematics*. Symposium at the annual meeting of the National Council of Teachers of Mathematics, New Orleans, LA.
- Seago, N. & Jacobs, J. (2013). The Learning and Teaching Geometry Project: A highly-specified, video-based approach to teacher learning. In *From adaptive to specific: Effects of video-based instructional approaches on teacher learning*. Symposium at the biennial



- conference of the European Association for Research on Learning and Instruction, Munich, Germany.
- Koellner, K. & Jacobs, J. (2013). Impact of the Problem-Solving Cycle on participating teachers' classroom instruction. In *The Problem-Solving Cycle: Multiple studies of a mathematics professional development program*. Symposium at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Koellner, K., Funderburk, J., & Jacobs, J. (2013). Mathematics professional development by teacher leaders: A Colorado school district's experiences using the Problem-Solving Cycle. Presentation at the annual meeting of the National Council of Supervisors of Mathematics, Denver, CO.
- Borko, H., Koellner, K. & Jacobs, J., Mangram, C., Khachatryan, E., & Virmani, R. (2012, April). Preparing instructional leaders to facilitate mathematics professional development. In *Issues in the facilitation of video-based professional development*. Symposium at the annual meeting of the American Educational Research Association, Vancouver B.C., Canada.
- Koellner, K., Jacobs, J., King, C., John, T., & Borko, H. (2012, April). Professional development for mathematics teachers: Examining the impact on knowledge and instructional practice. In *Understanding the development of high-leverage mathematics teaching practices*. Symposium at the annual meeting of the American Educational Research Association, Vancouver B.C., Canada.
- Seago, N., Borko, H. & Jacobs, J. (2011 August). Teacher learning through videocase professional development. In *Teacher learning in the context of educational innovation*. Symposium presented at the biennial conference of the European Association for Research on Learning and Instruction, Exeter, UK.
- Kazemi, E., Elliott, R., Carroll, C., Kelley-Petersen, M., Borko, H., Koellner, K., Jacobs, J., & Selling, S.K. (2011, April). Professional development: Leading mathematical tasks versus discussions of classroom practice. Working session at the annual meeting of the National Council of Teachers of Mathematics, Indianapolis, IN.
- Baldinger, E., Borko, H., Jacobs, J., Koellner, K. & Selling, S.K. (2011, April). Modifications to mathematical tasks in the Problem-Solving Cycle: Impact on mathematics and cognitive demand. Symposium at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Borko, H., Koellner, K. & Jacobs, J., Baldinger, E. & Selling, S.K. (2010, April). Preparing instructional leaders to facilitate mathematics professional development. In *Investigations in scaling-up professional development programs: Implications for policy and practice*. Symposium at the annual meeting of the American Educational Research Association, Denver, CO.
- Seago, N. Callahan, P., Driscoll, M., Nikula, J. & Jacobs, J. (2010, April). Using videocases to develop teachers' conceptual understanding of mathematics. Presentation at an extended session at the annual conference of the National Council of Supervisors of Mathematics, Washington, D.C.
- Jacobs, J. & Koellner, K. (2010, March). Improving the work performance of teachers-and other like professionals: Can it be done? Presentation for the Center for the Integrative Study of Work, University of Colorado at Boulder.

- Jacobs, J. (2009, August). Learning and teaching geometry: The foundation module. Poster presented at the Representations of Mathematics Teaching in Research and Teacher Education conference, Ann Arbor, MI.
- Koellner, K., Borko, H., & Jacobs, J. (2009, August). Teacher learning using video of their practice. In *What do and should we know about how teachers learn from video?* Symposium presented at the biennial conference of the European Association for Research on Learning and Instruction, Amsterdam.
- Seago, N., Jacobs, J., & Borko, H. (2009, August). Designing videocases for teacher learning focused on content. In *What do and should we know about how teachers learn from video?* Symposium presented at the biennial conference of the European Association for Research on Learning and Instruction, Amsterdam.
- Koellner, K., Jacobs, J. & Borko, H. (2009, April). Supporting instructional leaders to facilitate explorations of students' mathematical reasoning: The Problem-Solving Cycle model of professional development. In *Teacher learning about student mathematical thinking: A discussion of various professional development models and research methodologies.* Symposium conducted at the annual meeting of the American Educational Research Association, San Diego.
- Seago, N., Driscoll, M., & Jacobs, J. (2009, April). Transforming middle school geometry: Professional development materials that support the teaching and learning of similarity. Paper presented at the annual meeting of the American Educational Research Association, San Diego.
- Seago, N. & Jacobs, J. (2009, April). Why similarity? Exploring the importance of mathematical similarity throughout middle grades mathematics by analyzing videocases used to foster teacher learning. Paper presented at the annual conference of the National Council of Supervisors of Mathematics, Washington, D.C.
- Borko, H., Jacobs, J., & Koellner, K. (2007, April). Characterizing the facilitator's role in the Problem-Solving Cycle model of professional development. In *Conceptualizing and investigating the practice of facilitation in content-oriented teacher professional development.* Symposium conducted at the annual meeting of the American Educational Research Association, Chicago.
- Jacobs, J., Borko, H., & Koellner, K. (2007, April). Using video to analyze learning from the Problem-Solving Cycle. In *Video as a research tool for studying instructional practice.* Symposium conducted at the annual meeting of the American Educational Research Association, Chicago.
- Clark, K. and Jacobs, J. (2006, April). The role of individual teacher's goals in the STAAR professional development. In *The Problem-Solving Cycle: An approach to mathematics professional development.* Symposium conducted at the annual meeting of the American Educational Research Association, San Francisco.
- Eiteljorg, E., Schneider, C., Pittman, M., Jacobs, J., Clark, K., Frykholm, J., and Borko, H. (2005, April). Content, community, and pedagogy: Professional development to support the transition from arithmetic to algebraic reasoning. Paper presented at the American Educational Research Association Annual Meeting, Montreal, Quebec.
- Givvin, K.B., Jacobs, J., & Hollingsworth, H. (2004, April). Lesson signatures: A methodology for examining the interplay of variables across time. Paper presented at the American Educational Research Association Annual Meeting, San Diego, CA.

- Givvin, K.B., Jacobs, J., & Hollingsworth, H. (2003, April). Convergence and variation in lesson structure: Examining lessons from seven countries for evidence of “cultural scripts.” Paper presented at the American Educational Research Association Annual Meeting, Chicago, IL.
- Jacobs, J.K., Morita, E. & Stigler, J.W. (1998, April). Japanese and American teachers’ beliefs about mathematics instruction. Paper presented at the American Educational Research Association Annual Meeting, San Diego, CA.
- Garnier, H. and Jacobs, J.K. (1998, February). A 20-year longitudinal study of the antecedents and outcomes of high school experiences of adolescent boys and girls. Poster presented at the Society for Research on Adolescence Biennial Meeting, San Diego, CA.
- Jacobs, J.K., Morita, E., & Stigler, J. (1997, June). Assessing Japanese and American teachers’ beliefs about mathematics instruction. Poster presented at the Jean Piaget Society Annual Symposium, Los Angeles, CA.
- Jacobs, J.K., Morita, E., Yoshida, M., Fernandez, C., & Stigler, J. (1997, March). Reflection as a tool to elicit teachers’ beliefs in Japan and the United States. Paper presented at the American Educational Research Association Annual Meeting, Chicago, IL.
- Jacobs, J.K., Yoshida, M., Fernandez, C., & Stigler, J. (1996, July). Japanese and American teachers’ implicit theories of mathematics learning and instruction. Poster presented at the Cognitive Science Society Annual Conference, San Diego, CA.
- Garnier, H. and Jacobs, J. (1996, April). The influence of family lifestyles and values on peer socialization in adolescence: A 19-year longitudinal study of nonconventional families. Paper presented at the American Educational Research Association Annual Meeting, New York, NY.
- Jacobs, J.K. (1996, March). The impact of early family life on the process of dropping out of high school. Poster presented at the Society for Research on Adolescence Biennial Meeting, Boston, MA.
- Garnier, H., Stein, J.A., & Jacobs, J.K. (1995, April). Longitudinal model of family nonconventionality, adolescent achievement, and drug use on completion of high school. Poster presented at the American Educational Research Association Annual Meeting, San Francisco, CA.
- Jacobs, J.K., Yoshida, M., Lippey, H., Fernandez, C., & Stigler, J. (1994, April). American and Japanese teachers’ theories of mathematics instruction and classroom practices. Poster presented at the American Educational Research Association Annual Meeting, New Orleans, LA.
- Jacobs, J.K., Yoshida, M., Lippey, H., Fernandez, C., & Stigler, J. (1994, February). Japanese and American teachers’ responses to foreign and familiar mathematics lessons. Paper presented at the Society for Cross-Cultural Research Annual Meeting, Santa Fe, NM.

## **SERVICE**

Journal Reviewer: *Comparative Education Review, International Journal of Research in Education and Science, International Journal of STEM Education, Journal for Educational Research Online, Journal of Mathematics Teacher Education, Journal for Research in Mathematics Education, Journal of Teacher Education, Learning and Individual Differences,*

*Teaching and Teacher Education, and Zentralblatt für Didaktik der Mathematik: International Reviews on Mathematical Education.*

Institute of Cognitive Science, Faculty Committee Member  
Mentor/supervisor of CU Boulder undergraduate, graduate and post-doctoral students

## **AWARDS**

Distinguished research in teacher education, Association of Teacher Educators, 2017